Jesse V. Johnson

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PROFESSIONAL PREPARATION

University of Maine, Orono.

· Ph.D. in Physics, May 2002.

· M.S. in Computer Science, May 2003.

University of Minnesota, Twin Cities.

· B.S. in Physics, December 1993.

GRADUATE ADVISOR

James L. Fastook, University of Maine

APPOINTMENTS

Fulbright Scholar Namibian University of Science and Technology (2016)

Adjunct Professor University of Buffalo (April 2015 – Present)

Professor The University of Montana (August 2012 – Present)

Associate Professor The University of Montana (August 2007 – August 2012)

Assistant Professor The University of Montana (August 2002 – August 2007)

Research Assistant University of Maine, Orono (June 1999 – June 2002)

Field Assistant *Nathaniel B. Palmer*, Amundsen Sea, Antarctica (2001)

Teaching Assistant, University of Maine, Orono (September 1997 – May 1999)

Secondary School Teacher U.S. Peace Corps, Malawi (June 1994 – May 1996)

PUBLICATIONS ISI LISTED

◇ Rogozhina, I., A.G. Petrunin, A.P.N. Vaughan, B. Steinberger, **J.V. Johnson**, M. Kaban, R. Calov, F. Rickers,M. Thomas, and I. Koulakov (2016), "Melting at the base of the Greenland ice sheet explained by Iceland hotspot history", *Nature Geoscience* 9, 366369 doi:10.1038/ngeo2689

◇ O.P. Layeni and **J.V. Johnson** (2016), "Exact closed-form solutions of some Stefan problems in thermally heterogeneous cylinders" *Mechanics Reseach Communications* doi:10.1016/j.mechrescom.2015.09.012

◇ Brinkerhoff, D. and **Johnson, J.V.** (2015), "A stabilized finite element method for calculating balance velocities in ice sheets", *Geosci. Model Dev.*, 8, 1275-1283, doi:10.5194/gmd-8-1275-2015, 2015.

◇ Brinkerhoff, D. J., and **J. V. Johnson** (2015), "Dynamics of thermally induced ice streams simulated with a higher-order flow model", *J. Geophys. Res. Earth Surf.*, 120, doi:10.1002/2015JF003499.

- van der Veen, C.J., L.A. Stearns, **J.V. Johnson**, B. Csatho (2014) "Flow Dynamics of Byrd Glacier, East Antarctica", *Journal of Glaciology*, vol. 60 (224), doi: 10.3189/2014JoG14J052
- Brinkerhoff, D.J and **J.V. Johnson** (2013) "Data assimilation and prognostic whole ice-sheet modelling with the variationally derived, higher-order, open source, and fully parallel ice sheet model VarGlaS", *The Cryosphere*, 7, 1161-1184, 2013 (www.the-cryosphere.net/7/1161/2013/) doi:10.5194/tc-7-1161-2013
- Bindschadler, R. A., S. Nowicki, A. Abe-Ouchi, A. Aschwanden, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jackson, **J.V. Johnson**, C. Kroulev, A. Levermann, W. Lipsomb, M. Martin, M. Morlighem, B. Parizek, D. Pollard, S. Price, D. Ren, F. Saito, T Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker and W. Wang, (2013) "Ice-sheet model sensitivities to environmental forcing and their use in projecting future sea-level (the SeaRISE project)", *Journal of Glaciology* Vol. 59, No.214, doi:10.3189/2013JoG12J125
- Nowicki, S., R. Bindschadler, A. Abe-Ouchi, A. Aschwanden, E. Bueler, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jackson, **J.V. Johnson**, C. Kroulev, E. Larour, A. Levermann, W. Lipsomb, M. Martin, M. Morlighem, B. Parizek, D. Pollard, S. Price, E. Rignot, D. Ren, F. Saito, T Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker and W. Wang (2013) "Insights into spatial sensitivities of ice mass response to environmental change from the SeaRISE ice sheet modeling project I. Antarctica", *Journal of Geophysical Research - Earth Surface* doi: 10.1002/jgrf.20081.
- Nowicki, S., R. Bindschadler, A. Abe-Ouchi, A. Aschwanden, E. Bueler, H. Choi, J. Fastook, G. Granzow, R. Greve, G. Gutowski, U. Herzfeld, C. Jackson, **J.V. Johnson**, C. Kroulev, E. Larour, A. Levermann, W. Lipsomb, M. Martin, M. Morlighem, B. Parizek, D. Pollard, S. Price, E. Rignot, D. Ren, F. Saito, T Sato, H. Seddik, H. Seroussi, K. Takahashi, R. Walker and W. Wang. (2013) "Insights into spatial sensitivities of ice mass response to environmental change from the SeaRISE ice sheet modeling project II. Greenland", *Journal of Geophysical Research* - Earth Surface doi: 10.1002/jgrf.20076 .
- O.P. Layeni, **J.V. Johnson**, (2012) "Hybrids of the heat balance integral method", *Applied Mathematics and Computation*, Volume 218, Issue 14, Pages 7431-7444, ISSN 0096-3003, 10.1016/j.amc.2012.01.001. (http://www.sciencedirect.com/science/article/pii/S0096300312000069)
- S.P. Carter, H.A. Fricker, D.D. Blankenship, **J.V. Johnson**, W. Lipscomb, S.F. Price, D.A. Young, (2011) "Modeling five years of subglacial lake activity in the MacAyeal Ice Stream catchment through assimilation of ICESat laser altimety", *Journal of Glaciology*, vol. 57 (206) pp. 1098-1112
- D.J. Brinkerhoff, T.W. Meierbachtol, **J.V. Johnson**, J.T. Harper, (2011) "Sensitivity of the frozen-melted basal boundary to perturbations of basal traction and geothermal heat flux: Isunnguata Sermia, western Greenland", *Annals of Glaciology*, 52(59) pp. 42-50
- R. Calov, R. Greve, A. Abe-Ouchi, E. Bueler, P. Huybrechts, **J.V. Johnson**, F. Pattyn, D. Pollard, C. Ritz, F. Saito, L. Tarasov (2010) "Results from the Ice-Sheet Model Intercomparison ProjectHeinrich Event INtercOmparison (ISMIP HEINO)", *Journal of Glaciology* vol. 56 (197) pp. 371-383
- S. E. Morales, T.F. Cosart, **J.V. Johnson**, W.E. Holben (2009) "Extensive Phylogenetic Analysis of a Soil Bacterial Community Illustrates Extreme Taxon Evenness and the Effects of Amplicon Length, Degree of Coverage, and DNA Fractionation on Classification and Ecological Parameters", *Appl Environ Microb* 75(3) 668-675

- S. E. Morales, T.F. Cosart, **J.V. Johnson**, W. E. Holben (2008) "Supplemental programs for enhanced recovery of data from the DOTUR application.", *J Microbiol Meth* vol. 75 (3) 572-575
- A. R. Lewis, D. R. Marchant, A. C. Ashworth, L. Hedenäs, S. R. Hemming, **J.V. Johnson**, M. J. Leng, M. L. Machlus, A. E. Newton, J. I. Raine, J. K. Willenbring, M. Williams, A. P. Wolfe (2008) "Mid-Miocene cooling and the extinction of tundra in continental Antarctica", *PNAS* 105:10676-10680; 2008, doi:10.1073/pnas.0802501105
- Pattyn, F., Perichon, L., Aschwanden, A., Breuer, B., de Smedt, B., Gagliardini, O., Gudmundsson, G. H., Hindmarsh, R. C. A., Hubbard, A., **Johnson**, J.V., Kleiner, T., Konovalov, Y., Martin, C., Payne, A. J., Pollard, D., Price, S., Rckamp, M., Saito, F., Souek, O., Sugiyama, S., and Zwinger, T. (2008) "Benchmark experiments for higher-order and full-Stokes ice sheet models (ISMIPHOM)", *The Cryosphere*, 2, 95-108, 2008
- **J.V. Johnson** and J.W. Staiger (2007), "Modeling Long-term Stability of the Ferrar Glacier, East Antarctica: Implications for Interpreting Cosmogenic Nuclide Inheritance", *Journal of Geophysical Research*, 112, F03S30 doi:10.1029/2006JF000599
- Staiger, J.W., Gosse, J.C., Little, E.C., Utting, D.J., Finkel, R., **Johnson, J.V.**, Fastook, J. (2006) "Glacial Erosion and Sediment Dispersion from Detrital Cosmogenic Nuclide Analyses of Till", *Quaternary Geochronology* 1(1): 29-42
- J. W. Staiger, J. C. Gosse, R. Toracinta, R. Oglesby, J. L. Fastook, **J.V. Johnson** (2006) "Atmospheric scaling of cosmogenic nuclide production: the climate effect.", *Journal of Geophysical Research* 112(B2), B02205 doi: 10.1029/2005JB003811
- Staiger, J.W., Gosse J.C, **Johnson, J.V.**, Fastook J., Gray J.T., Stockli D.F., Stockli L., and Finkel R."Relief generation by polythermal glacier ice", *Earth Surface Processes and Landforms* (2005) 30 (9): 1145-1159
- Staiger, J.W., Marchant, D.R., Oberholzer, P., Schaefer, J.M., **Johnson, J.V.**, Lewis, A.R. "Late Miocene-Pleistocene history of Ferrar Glacier, Antarctica: Implications for climate and ice sheet stability", *Earth and Planetary Science Letters* (2005) 243 (3-4): 489–503
- **Johnson, J.V.**, Prescott P.R. and Hughes T.H. "Ice dynamics preceding catastrophic disintegration of the floating part of Jababshavn Isbræ", *Journal of Glaciology* (2004) 50 (171): 492-504
- Naslund, J.O., P. Jansson, J.L. Fastook, and **J. Johnson**, (2004) "Modeling ice-sheet basal meltwater production using realistic geothermal heat flow data", *Annals of Glaciology* **(40)** 047
- **Johnson, J.V.** and Fastook, J.L. (2002) "Northern Hemisphere glaciation and its sensitivity to basal melt water", *Quaternary International.* **(95)**, 65-74

PUBLICATIONS OTHER

- Harper J, Hubbard A, Ruskeeniemi T, Claesson Liljedahl L, Kontula A, Bougamont M, Brown J, Dirkson A, Dow C, Doyle S, Drake H, Engstrm J, Fitzpatrick A, Follin S, Frape S, Graly J, Hansson K, Harrington J, Henkemans E, Hirschorn S, Hobbs M, Humphrey N, Jansson P, **Johnson J**, Jones G, Kinnbom P, Kennell L, Klint K E S, Liimatainen J, Lindbck K, Meierbachtol T, Pere T, Pettersson R, Tullborg E-L, van As D, 2016. The Greenland Analogue Project: Data and Processes. SKB R-14-13, Svensk Krnbrnslehantering AB.
- Korolev Y., Yagola A., **Johnson J.V.**, Brinkerhoff D. (2013), "Methods of error estimation in inverse problems on compacts sets in Banach lattices theory and applications in ice sheet modeling", *IPDO 2013 : 4th Inverse problems, design and optimization symposium*, Albi, ed. by O. Fudym, J.-L. Battaglia,

G.S. Dulikravich et al., Albi ; Ecole des Mines d'Albi-Carmaux, 2013 (ISBN 979-10-91526-01-2)

- ◇ O.P. Layeni and **J.V. Johnson** (2012), "Some explicit solutions for a class of one-phase Stefan problems", *AIP Conf. Proc.* 1479, 2379, DOI:10.1063/1.4756673
- ◇ W. Lipscomb, R. Bindschadler, E. Bueler, D. Holland, **J. Johnson**, S. Price, (2009) "A Community Ice Sheet Model for Sea Level Prediction." *Eos Trans.* 90(3) doi:10.1029/2009EO030004
- ◇ C. Little, S. Jacobs, **J.V. Johnson**, A. J. Payne, R. Hallberg, C. L. Hulbe, H. Levy, G. A. Schmidt, M. Winton, V. Balaji, T. L. Delworth, D. G. Vaughan, W. H. Lipscomb, G. K. C. Clarke, S. J. Marshall, R. B. Alley, D. M. Holland, R. J. Stouffer, M. Oppenheimer, B. R. Parizek (2007), "Toward a New Generation of Ice Sheet Models", *Eos Trans.* 88(52), 578, 10.1029/2007EO520002.
- ◇ SKB, 2006: Climate and climate related issues for the safety assessment SR-Can. SKB TR-06-23, Swedish Nuclear Waste Management Company. 186 pp.

Grants Awarded

- ◇ "Collaborative Research: Stability and Dynamics of Antarctic Marine Outlet Glaciers" awarded May, 2016 **NSF $214,702** over three years
- ◇ "Collaborative Research: Ice sheet sensitivity in a changing Arctic system - using geologic data and modeling to test the stable Greenland Ice Sheet hypothesis" awarded August 2015, **NSF $259,030** over four years.
- ◇ "A MOOC blended approach to training IT and computing professionals", awarded June 2015, **U.S. Department of State $80,810** over 11 months. Note that no overhead is generated on this grant.
- ◇ "Model inversion efforts in support of the SeaRISE II initiative" PI: **J.V. Johnson** awarded August 2014, **NASA $32,500** over three months
- ◇ "Land Unknown: Assessing Data Requirements for Modeling Change in the Antarctic Ice Sheet with an Emphasis on the Subglacial Bed" Co-Is: Charles Jackson and **J.V. Johnson**, awarded June 2013, $565,480 total funding, U. Montana Share **NSF $289,181** over 3 years,
- ◇ "Activation of high elevation alluvial fans in the Trans-Antarctic Mountains" PI: **J.V. Johnson** awarded June 2013, **NSF sub-award from NDSU $9,904** over one semester
- ◇ "Partitioning ice sheet surface elevation changes into dynamic, surface mass balance, and firn components" PI: **J.V. Johnson** awarded May 2013, **NASA $20,045** over one semester
- ◇ "Beyond Backstress: data driven assessment of outlet glacier dynamics" PI: Leigh Stearns (KU) Co-Is: C.J. Vander Veen **J.V. Johnson**, B. Csatho, awarded July 2011, $826,301 total funding, U. Montana Share **NASA $226,900** over 3 years,
- ◇ "Enhancement of NASAs Polar Research Missions: Adjoint Data Assimilation Into Numerical Models To Reveal Physical Properties Of The Greenland Ice Sheet" NASA EPSCoR, Co-Is **J.V. Johnson** and J. Harper, awarded August 2011, **NASA $1.08 million, plus $500,000 from state in match** over 3 years,
- ◇ MSU Space Grant Fellowship for advisee Douglas Brinkerhoff (2011), **NASA $11,000**, one semester,
- ◇ MSU Space Grant Fellowship for advisee Douglas Brinkerhoff (2010-2011), **NASA $22,000**, one year,
- ◇ 2010-2011 UM Exchange program award for **J.V. Johnson** to South Africa, **UM Exchange $25,000**, one year,

- ◇ "Collaborations in Mathematics and Geosciences: Enabling ice sheet sensitivity and stability analysis with a large-scale higher-order ice sheet model's adjoint to support sea level change assessment" PI Jesse Johnson, awarded in 2009; **NSF $184,000**, over 3 years,
- ◇ "Collaborative Research: Greenland Ice Sheet Basal Hydrology and Sliding Dynamics - The Proof of the Drill" NSF, PI Joel Harper, Co-Is T. Pfeffer, **J.V. Johnson**, N. Humphry; awarded in 2009 **NSF $475,000** over 4 years,
- ◇ "GAP, the Greenland Analog Project" SKB (Swedish Nuclear Waste Management Company), PI Joel Harper, Co-I **J.V. Johnson** awarded in 2009; **SKB $289,314** over 3 years,
- ◇ "Data preparation and simulation studies in support of seaRISE efforts" NASA, PI: **J.V. Johnson**, awarded in 2009; **NASA $119,883** over 1 year,
- ◇ "Collaborative Research: IPY, The Next Generation: A Community Ice Sheet Model for scientists and educators" PI: **J.V. Johnson**, CO-I J. Henry plus partners at 4 other institutions, awarded in 2007; **NSF $315,000** over 2 years,
- ◇ Howard Hughes Medical Institute Award, PI Bill Holben, Co-Is J. Graham, **J.V. Johnson**; awarded in 2005 **HHMI $1.5 million** over 4 years,
- ◇ Montana Ecology of Infectious Disease, NSF IGERT, PI W. Holben, Co-Is **J.V. Johnson**, C. Bruener, G. Luikadt, J. Bardsley, awarded in 2005; **NSF $3,260,729** over 5 years, and
- ◇ Hewlett Packard Educational Technology Grant Grant PI J. Herny, co-I Y. Riemer, **J.V. Johnson**, Awarded in 2003; **HP $15,500 cash plus $58,000 dollars of equipment** over one year.

PRESENTATIONS

J.V. Johnson and Jacob Downs "Application of a sub-glacial hydrology model to realistic topography by resolving under and over-pressure with penalty methods.", Land Ice Working Group Session, Summer meeting, Breckenridge, CO 17 June, 2015

Cowper Lecture Series: Invited lecture **Johnson, J.V.** "The Quest for the World's Fastest Ice", The University at Buffalo SUNY, 20 February, 2015

Invited participant **Johnson, J.V.** Polar DataViz and a hackathon on Polar CyberInfrastructure, New York City, Parsons New School for Design,3-4 November, 2014.

J.V. Johnson, D.J. Brinkerhoff, L.A. Stearns, and C.J. van der Veen "Longitudinal stress gradients in Greenland outlet glaciers", Land Ice Working Group Sesssion, Summer meeting, Breckenridge CO, 18 June, 2014

J.V. Johnson "Greenland outlet glaciers: What ice-sheet modelers would like from observationalists" NSF Interagency Arctic Research Policy Committee (IARPC) grant planning panel presentation, given online 8 May, 2014

J.V. Johnson, E. Cummings, D.J. Brinkerhoff, C.J. van der Veen, L.A. Stearns, and B. Csatho "Using data assimilation methods to explore the role of longitudinal stress gradients in Greenland outlet glacier flow" International Glaciological Society International Symposium on Glaciers and Ice Sheets Contribution to Sea-Level Change (Observations, Modelling and Prediction), Chamonix-Mont-Blanc France, 29 May 2014

J.V. Johnson, D.J. Brinkerhoff "Application of physics-based interpolation to cryospheric data", Land Ice Working Group Sesssion, Winter meeting, Boulder CO, 30 January, 2014

Johnson, J.V., Brinkerhoff, D.J.,"Application of physics-based interpolation to cryospheric data (Invited)" Abstract C51C-01 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Brinkerhoff, D.J., and **Johnson, J.V.**, "Transient minimization in data assimilation: examining the effect of plausible initial conditions and model forcings on the evolution of the Greenland ice sheet" Abstract DI31A-2194 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Meierbachtol, T.W., Harper, J.T., **Johnson, J.V.**, Humphrey, N.F., Brinkerhoff, D.J., "Data-driven constraints on ice sheet model boundary conditions and comparison to borehole observations in Western Greenland" Abstract C53B-0554 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Jackson, C.S., Goff, J.A., Waibel, S., Greene, C.A., **Johnson, J.V.**, Young, D A, Blankenship, D D,"Representation of Thwaites Glacier Bed Uncertainty for Modeling Experiments" Abstract C51A-0519 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Cavitte, M.G., Blankenship, D.D., **Johnson, J.V.**, Young, D.A., Carter, S.P., Gutowski, G., Siegert, M.J., Jackson, C.S., "Constraints on transient fast flow at South Pole in the last glacial cycle" Abstract C51A-0514 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Harper, J.T., Meierbachtol, T.W., **Johnson, J.V.**, Humphrey, N.F., Graly, J.A., "Physical Conditions of the Greenland Ice Sheet Bed: A Divide-to-Margin Transect (Invited)" Abstract C44A-04 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Dirkson, A., Harper, J.T., Humphrey, N.F., **Johnson, J.V.**, "Partitioning the Refreezing of Meltwater in Firn in the Percolation Zone of Western Greenland" Abstract C21C-0642 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

J.V. Johnson, D.J. Brinkerhoff, L.A. Stearns, B. Csatho and C.J. van der Veen "The Sensitivity Greenland force balance calculations to mass conserving reconstructions of the bed", International Glaciological Societys International Symposium on Radioglaciology, Lawrence KA, 12 September 2013.

J.V. Johnson, D.J. Brinkerhoff, K. Sack, S. Nowicki "Mass conserving calculation of glacial bed elevation", Land Ice Working Group Sesssion, Winter meeting, Boulder CO, 14 February, 2013

J.V. Johnson and D.J. Brinkerhoff "A finite element based approach to computing balance velocities with application to Greenland mass balance", Land Ice Working Group Sesssion, Summer meeting, Breckenridge, CO 19 June, 2013

J.V. Johnson E. Cummings and D.J. Brinkerhoff "An introduction to VarGlaS: A variationally derived compuational model for Glacier Simulation", Ice sheet modeling summer workshop, Austin TX, 5–10 August, 2013

J.V. Johnson, D.J. Brinkerhoff, K. Sack, S. Nowicki "Mass conserving calculation of glacial bed elevation", Land Ice Working Group Sesssion, Winter meeting, Boulder CO, 14 February, 2013

J.V. Johnson, D.J. Brinkerhoff, K. Sack "Estimation and Propagation of errors in ice sheet bed elevation measurements", American Geophysical Union Meeting, San Francisco CA, December 2012

J.V. Johnson, M. Oswalt, D.J. Brinkerhoff, J. Harper "Using surface velocity observations to infer the parameters in a basal hydrology model", International Glaciological Society Nordic Branch Meeting, Stockholm Sweden, 25-27 October, 2012

J.V. Johnson "Drawing conclusions from inverse ice sheet modeling of the GAP field site", Greenland Analog Project annual meeting, Stockholm Sweden, 23 October, 2012

J.V. Johnson and D.J. Brinkerhoff "An inverse modeling approach to improving estimates of present day basal conditions of Issunguata Sermia, West Central Greenland", Applied Math Seminar, University of Montana, 20 March 2012

J.V. Johnson and D.J. Brinkerhoff "The Isunnguata Sermia region of west Greenland: Model activities in support of a field campaign", Northwest Glaciologists Meeting, October 15, 2011

J.V. Johnson "Use and implementation of adjoint methods in ice-sheet models", April 2010, University of Stellenbosch, Mechanical Engineering mini-Conference

J.V. Johnson "How ice-sheets are responding to changes in ocean ", December 2009, University of Cape Town, Oceanography Seminar

J.V. Johnson "Mathematical basis and open problems in the modeling of ice-sheets", October 2009, University of Cape Town, Mechanical Engineering Seminar

J.V. Johnson "GAP year two ice sheet modeling objectives", Greenland Analog Project annual meeting, Toronto Canada, 8 November, 2010

J.V. Johnson, D.J. Brinkerhoff, T. Meierbachtol, J. Harper, J. Utke "Use and implementation of adjoint methods in ice sheet models", Land Ice Working Group Sesssion, 15^{th} annual CCSM Workshop, 30 June, 2010

J.V. Johnson, T. Bocek, B. Hand, G. Granzow, "The best of prophets of the future is the past. Or is it the present?", American Geophysical Union Meeting, San Francisco CA, December 2009,

J.V. Johnson "Methods and tools for ice sheet modeling with a focus on the role of hydrologic processes", Greenland Analog Project annual meeting, Stockholm Sweden, 16 November, 2009

J.V. Johnson and D.J. Brinkerhoff, "Metrics for assessing ice-sheet model performance", Land Ice Working Group Winter Meeting, Boulder CO, 17 February, 2010

Tim Bocek and **J.V. Johnson**, *Invited Speakers* "Development of the Community Ice Sheet Model (CISM)", Land Ice Working Group Session, 14^{th} annual CCSM Workshop, 17 June, 2009

J.V. Johnson, *Invited Speaker* "Software Design Issues for Ice Sheet Models", Los Alamos National Laboratory, Workshop on Ice Sheet Modeling, 18-20 August, 2008

J.V. Johnson, *Invited Speaker* "Numerics Straw Man" workshop on improving Ice Sheet Models, St. Petersburg Russia, 5-7 July, 2008

J.V. Johnson, *Invited Speaker* "Ice Sheet Models: Physical Basis, Numerical Treatments and Software Developments": 8^{th} Annual Center for Atmosphere Ocean Science (CAOS) workshop, New York University, 22-23 February, 2008.

J.V. Johnson, Jens-Ove Näslund, Frank Pattyn, Peter Jansson: "High Resolution Heat Flux Data – Implications for Ice Sheet Dynamics and Model Uncertainty", American Geophysical Union Meeting, San Francisco CA, December 2007

R. Calov and **ISMIP-HEINO participants**, "First Results of the ISMIP-HEINO Model Intercomparison Project " European Geosciences Union Conference, Milan Italy, Spring 2007 Conference ; *Geophysical Research Abstracts*, **(9)**, 02910

◇ F. Pattyn and **ISMIP-HOM participants**, "ISMIP-HOM: Results of the Higher-Order Ice Sheet Model Intercomparison exercise" European Geosciences Union Conference, Milan Italy, April 2007; *Geophysical Research Abstracts*, **(9)**, 01351

- **J.V. Johnson**, "IPY, The Next Generation: A Community Ice Sheet Model for scientists and educators, with demonstration experiments in the Amundsen Sea Embayment region", WAIS Meeting, Stirling VA, September 2006
- **J.V. Johnson** and Ted Cosart "Allometric Scaling in Minimum Energy Dissipation and Minimal Material Type Transportation Networks" Dynamics of Complex Systems: Common Threads, Fairbanks AK, June 2007
- **J.V. Johnson** and Ted Cosart "Allometric Scaling in Minimum Energy Dissipation and Minimal Material Type Transportation Networks"National Academy of Sciences, Kavli Frontiers of Science Symposium, Arnold and Mabel Beckman Center - Irvine, California, November 2006
- **J.V. Johnson**"Towards a Community Ice Sheet Model", Princeton Geophysical Fluid Dynamics Laboratory (GFDL) Ice Sheet Modeling Workshop, January 2007
- **J.V. Johnson** "Developing a Community Ice Sheet Model for the International Polar Year", National Academy of Science, Polar Review Board Meeting, Keck Center, Washington D.C., November 2006
- **J.V. Johnson** "A Dynamic View of Subglacial Lakes in a Glaciation/Deglaciation Cycle", American Geophysical Union Meeting, San Francisco CA, December 2005
- Jared Rapp and **J.V. Johnson**"The use of a Discrete Element Model for Granular Materials to Investigate ice Shelf Formation and Break up in Jakobshavn Isbræ", American Geophysical Union Meeting, San Francisco CA, December 2005
- Staiger, J.W., Marchant, D.R., **Johnson, J.V.**, Oberholzer, P."Late Miocene-Pleistocene Stability of upper Ferrar Glacier, Dry Valleys, Antarctica", American Geophysical Union Meeting, San Francisco CA, December 2005
- **J.V. Johnson** "Proposed Amundsen Sea Embayment Modeling Activities for the International Polar Year", West Antarctica Ice Sheet Meeting, Stirling VA. September 2005
- S. De Brabander, F. Pattyn, **J.V. Johnson**, J. Näslund (2005) "Influence of geothermal heat variability on enhanced flow and onset of West Antarctic ice streams", *Geophysical Research Abstracts*, **(7)**, 07690
- **J.V. Johnson** "Use of Data Compression to Measure Relative Entropy of Strings: Applications to Paleo-Climate Records", Northwest Glaciology Meeting, Seattle WA September 2004
- **J.V. Johnson** "Allometric Scaling in Ice Sheets and Ice Streams", Northwest Glaciology Meeting, Seattle WA, September 2004 Jeremy Mason and J. Johnson
- **J.V. Johnson** "Estimating Basal Melt Rate in Antarctica", International Symposium on Ice and Water Interactions: Processes across the phase boundary, Portland, OR July 2004.
- **J.V. Johnson** "Jamming in Granular Materials and Till Deformation" Presentation, West Antarctic Ice Sheet Initiative Meeting, Washington D.C., September 2003.
- **J.V. Johnson** and Alex Petkov "Application of a basal water model to an embedded model for Atlantic Canada Glaciation", CANadian QUAternary Meeting (CANQUA), June 2003, Halifax Nova Scotia
- **J.V. Johnson** "An Erosional Model for Till" Presentation, Midwest Glaciology Meeting, Orono ME, March 2003

- John Gosse and **J.V. Johnson** "Climate influence on atmospheric scaling of cosmogenic nuclide production in rocks", Geological Society of America Meeting, Northeast Section, March 2003
- **J.V. Johnson** "Application of a Hydrologic Runoff Model to the West Antarctic Ice sheet." Presentation, West Antarctic Ice Sheet Initiative Meeting, Washington D.C., September 2002.
- **J.V. Johnson** and James Fastook "Lake Instability Mechanism for Fast Glacier Flow.", International Society of Glaciology Meeting on fast flow of glaciers, Yakutat, AK, June 2002.
- **J.V. Johnson** "The Positions of Ice Streams in Atlantic Canada During the Last Glaciation as Determined by a Basal Hydraulic Model for Ice Sheets." Presentation, Atlantic Canada Ice Dynamics (ACID) Workshop. Halifax, Nova Scotia, June 2002.
- **J.V. Johnson** "Lake Instability Mechanism for Fast Glacier Flow". Poster, Inland Northwest Research Alliance Conference, Boise, Idaho, October 2002.

Honors

2016 Fulbright Scholar to Namibia, Namibian University of Science and Technology

2015 Awarded faculty merit award

2012 Awarded full professor, University of Montana

2003–2013 4 faculty merit awards

2006 Kavli Frontiers of Science Conference participant

2007 Awarded tenure, University of Montana

2002–2010 Ad Hoc and panelist reviewer for NSF and NASA

2002–2010 Director, Montana State Science Fair

Synergistic Activities

- **2**016 Fulbright scholar to Namibia - "A MOOC blended approach to training IT and computing professionals"
- **2**015–Editor - Frontiers of Geoscience
- **2**009-2015 Co-Chair of Land Ice Working Group of the Community Climate Systems Model
- **2**010– National Snow and Ice Data Center Users Working Group member
- **2**010-2011 Faculty exchange, Univeristy of Cape Town, South Africa
- **O**rganizer of ice sheet modeling summer modeling school
- **C**o-investigator on multi-disciplinary NSF IGERT proposal to research mathematical dimensions of the ecology of infectious disease.
- **H**oward Hughes Medical Institute grant co-investigator. This grant supports integration of infectious disease material from the IGERT program into undergraduate research and course work.
- **M**ontana State Science Fair director, responsible for coordination of state fair. Active advisor on several student projects.
- **G**raduate Advisor or committee member to students in to Computer Science, Forestry, Chemistry, Mathematics, and Physics.

Collaborators

- **J**oel Harper, *Univeristy of Montana*
- **S**tephen Price *Los Alamos National Laboratories*

- ◇ **W**illiam Lipscomb *Los Alamos National Laboratories*
- ◇ **B**eatha Csatho *University of Buffalo*
- ◇ **C**ornelius J. van der Veen *University of Kansas*
- ◇ **L**eigh Stearns *University of Kansas*
- ◇ **F**rank Pattyn, *Université Libre de Bruxelles*
- ◇ **J**ane Willenbring, *Pennsylvania State University*
- ◇ **A**dam Lewis, *North Dakota State University*
- ◇ **C**hristina Hulbe, *University of Otago*
- ◇ **P**eter Jansson, *University of Stockholm, Sweden*

COURSES TAUGHT

- ◇ **A**lgorithms
- ◇ **D**irected Learning in Computer Science: a Massive, Open, Online Course (MOOC) Hybrid
- ◇ **I**ntroduction to Python Programming for Scientists
- ◇ **C++** Programming for Engineers
- ◇ **I**ntroduction to the Finite Element Method
- ◇ **S**tatistical, Dynamical, and Computational Modeling
- ◇ **C**omputer Simulation and Modeling
- ◇ **P**rogramming Languages
- ◇ **D**ata Structures
- ◇ **C**omputer Architectures
- ◇ **C**omputer Graphics
- ◇ **S**cientific Visualization
- ◇ **I**ntroduction to Computer Science

STUDENTS ADVISED

Jeremy Sauer: Computer Science Masters Completed May 2005–"Geostrophic Vorticity Equation with Finite Element and Spectral Methods: A Comparison"

Alex Petkov: Computer Science Masters Completed May 2005– "Transparent Line Integral Convolution Method in OpenDX"

Jeremy Mason: Computer Science Masters Completed May 2005– "Channel Networks in Ice"

Jared Rapp: Computer Science Masters Completed May 2006– "A Discrete Element Model for Ice Flow in Jakobshavns Isbræ".

Ted Cosart: Computer Science Masters Completed May 2006– "Optimal Channel Networks measured with Allometry and Optimized with Simulated Annealing".

Tong Xianping: Computer Science Masters, Completed December 2006 – "An Ordinary Differential Equations Approach to Modeling Methadone Levels"

Russ Parsons: Forestry Ph.D., Completed December 2007 –"Quantitative Basis For Evaluation Of Fuels Treatments In Heterogeneous Fuels in Douglas-Fir Forests With Simulation Modeling"

James Fishbaugh: Computer Science Masters, Completed May 2007 – "Development of a Higher-Order Ice Sheet Model with a Rescaled Coordinate System"

Timothy Bocek : Computer Science Masters, Completed August 2009 – "Integrating Higher Order Physics in the Community Ice Sheet Model: Scientic and Software Concerns"

Brian Hand: Computer Science Masters, Completed August 2009 – "Model Initialization Process for Antarctic and Greenland Ice Sheets with Extensions to 100 Year Predictions"

Timothy Wylie: Computer Science Masters, Completed May 2010 – "Integration of an HP-adaptive finite element analysis library into the community ice sheet model"

Stephen Garcia: Computer Science Masters, Completed May 2011 – "Real-time smoothed particle hydrodynamics with the CUDA platform"

Ted Cosart: Interdisciplinary Ph.D. Completed June 2013– "Evaluation of a new method for large-scale and grmr targeted next generation DNA sequencing in nonmodel species".

Glen Grenzow: Computer Science Masters, Completed November 2013 – "An Investigation of Viscosity Using Measured Velocities on Helheim Glacier"

Meghan Oswalt: Computer Science Masters, Completed June 2014 – "Greenland subglacial hydrology model"

Toby Meierbachtol: Geoscience Ph.D. (co-advisor Joel Harper), Completed June 2014 – "Ice dynamics over a land terminating sector of Western Greenland"

William Lyon *"An Adaptive Hybrid Method For Link Prediction In Multi-Modal Directed Complex Networks Using The Graph Traversal Pattern"*, Computer Science Masters, December 2014